Employability outcomes for university joint honours graduates.

Employability outcomes for university joint honours graduates

Abstract

In the United Kingdom (UK) the vast majority of university students specialise and study just one subject at bachelor degree level, commonly known in the UK as a single honours degree. However nearly all British universities will permit students if they wish to study two or even three subjects (UCAS 2016a), so called joint or combined honours degrees, internationally known as a double major. Our study sought to explore whether the study of a joint rather than a single honours degree had an impact on employment outcomes six months after graduation. We found an approximately consistent year-on-year 3% point negative gap nationally in the highly skilled employment rates of joint compared with single honours graduates. Further research will aim to provide higher education institutions with observations and recommendations that may assist them in providing double majors or joint honours degrees that lead to excellent highly skilled graduate employability outcomes, and in closing the current gap between single honours and joint honours graduates.

Keywords

Employability; United Kingdom; joint honours; double majors; graduate destinations; highly skilled.

1. Introduction

In the United Kingdom (UK) the vast majority of students specialise throughout their degree and study just one academic subject area at bachelor degree level (UCAS 2016b), commonly known in the UK as a single honours degree. This is in contrast to other systems globally, for example in North America, where students must achieve a breath of knowledge across academic disciplines, together with depth of knowledge in their major subject. Notwithstanding the emphasis on early specialisation

in the UK, nearly all British universities (UCAS 2016a) will actually permit students if they wish to study two or even three subjects in parallel, so called joint or combined honours degrees, which would be known as a double major internationally. In any particular university, there are constraints on what pairs of subjects can be combined in study, usually for organisational purposes since the units of teaching ('modules/units' in Europe or 'courses' in Canada and the United States) that comprise the degree must be timetabled to avoid clashes. Many universities will constrain subject pairings to within a particular academically cognate area, e.g. the social sciences; alternatively students may be permitted to study business, the most popular joint honours degree (UCAS 2016c), or a foreign language, say, alongside another subject drawn from a broad selection. Yet other higher education institutions allow students to pair two different subjects relatively flexibly from a prescribed list, often though featuring zoning or grouping to facilitate clash-free timetabling.

The United Kingdom model where specialist, single honours degrees of relatively short duration dominate is of course not replicated the world over. In the United States of America, Australia and Canada the major/minor route is pre-eminent. Interestingly however more recently there has been an increase in the so-called 'double major' (Paton 2014) which is more akin to the UK joint honours degrees. In South Africa students in Arts or Social Sciences are required to study two approved majors, again similar to a UK joint honours degree. Across Europe there is a mixed picture, as in the UK, with students studying a variety of vocational and academic disciplines as single or joint honours. So although this study relates to an analysis of UK graduate employment data, the conclusions will be relevant to any university education system where there is a mix of study options open to the students, ranging from specialisation at an early stage, through to maintaining a breadth of study throughout the degree.

Across the world, the intrinsic value of a higher education is increasingly linked with the ability of the graduate to secure highly skilled employment post-graduation (Minocha et al, 2017). Internationally there are various methods adopted in order to measure graduate employment levels in highly skilled destinations (EUROSTAT, 2017; OECD, 2017; NCES, 2017). In the United Kingdom, the Higher Education Statistics Agency (HESA) is responsible for collecting student-related data from all UK higher education institutions and one of their surveys, the Destination of Leavers from Higher Education (DLHE), summarises what graduates are doing six months after finishing their degrees. This includes both UK and European Union (EU) domiciled graduates. The DLHE survey was first run in 2003 replacing the 'First Destination Survey', a similar survey which had run since 1982 under the then Higher Education Authority (HEA 2017). According to the Higher Education Statistics Agency (HEA 2017 a), the DLHE survey also includes a longitudinal component, facilitating the tracking of graduates as they progress through their careers. However there is evidence linking a lack of success at the six month point with future career success, meaning this snapshot is also used as a proxy for indicating longer term career success (Elias 1999). The DLHE survey forms the dataset at the heart of this study, and although proprietary to the United Kingdom, conclusions drawn from its analysis can be used to make inferences for other countries, notwithstanding the variation in the definitions in national statistics as regards employment status, occupational categories etc.

The rest of this paper is structured in the following way: we state the aim of the study, namely to use the DLHE dataset to explore whether joint honours graduates are more or less employed than their single honours counterparts. The objectives are summarised, indicating how the DLHE dataset will be evaluated by type of higher education institution, nation within the UK and by Russell Group, to establish whether these factors affected employment. The methodology follows, describing in detail how 'joint honours degrees' were defined for this study – a conservative definition is used that can

be applied systematically to our very large DLHE dataset. Results and analysis follow, together with a discussion section which explores the possible underlying reasons for the results found. Lastly a future work section outlines where the research will go next.

2. This Study: That Completing a Joint or Combined Honours Degree has a Measurable Impact on Graduates' Highly Skilled Graduate Employability

a. Aim

A number of recent studies (Webber 2014; Walker and Zhu 2011; Dale and Krueger 2014) have found variation in graduate pay prospects across a range of different factors, including the subject and classification of degree and, potentially, the type of university. Our study sought to explore the additional factor of whether the students had completed a single or a joint honours degree, and the impact this may have on graduate outcomes six months after graduation. We sought to establish this by analysing the HESA DLHE survey data between 2011/12 to 2014/15. Our study specifically considered full-time undergraduates in the UK.

b. Objectives

The objectives of the study were to first distinguish between and then to separate out the single and joint honours degrees from the complete dataset provided from the HESA DLHE survey. The data was then analysed to establish whether there was a difference in the highly skilled graduate employability of the two cohorts. Furthermore, the data was analysed to establish whether there were any differences inherent in completing a joint honours degree in a post-1992 higher education

institution (typically former vocationally oriented polytechnics), by nation within the UK or within a Russell Group higher education institution (research-driven universities which are highly selective in terms of student qualifications on entry). We analysed whether the proportion of students completing joint honours degrees at a particular higher education institution affected their likelihood of highly skilled employment. Lastly we also established whether students completing joint honours degrees in higher education institutions with generally higher levels of highly skilled employment fared better, in terms of their relative performance in securing a highly skilled job themselves.

c. Methodology

In the United Kingdom, the Joint Academic Coding System (JACS) is a way of classifying academic subjects into their various disciplines, with the latest version JACS 3.0 coming into effect in 2012/13, according to the Higher Education Statistics Agency (2017 b). The system is co-owned and maintained by HESA and the Universities and Colleges Admissions Service (UCAS). The JACS classification was pivotal in our study in identifying joint honours degrees. The dataset in our study comprised the DLHE survey data from 2011/12 to 2014/15 inclusive, and the dataset acquired from HESA for this study crucially included up to three JACS principal subjects studied by the student; this provided the lever with which to identify single versus joint honours degrees and to analyse them as separate cohorts.

In our study, where a degree mapped onto just one JACS principal subject, this was deemed a single honours degree. Joint honours degrees were therefore defined as being where the student had studied two or three principal subjects that mapped to more than one JACS subject area. For example, 'History and Mathematics', with principal subjects V1 and G1 respectively, mapped to two different JACS subject areas V and G, and was considered a joint honours degree. In contrast, 'Physics and

Astronomy', with principal subjects F3 and F5 respectively, was considered a single honours degree as both principal subjects were contained within the same JACS subject area, F. This approach was simple, algorithmic and ensured that the joint honours degrees in our dataset were those that only featured two or three different subjects taught in different academic disciplines. This therefore captured the group of graduates who had studied subjects in very different discipline areas.

It may be argued that this approach excluded some 'genuine' joint honours combinations that occurred where pairs of subjects were studied from the same JACS subject area. For example, the biological sciences subject area contained biology, sport and psychology (Higher Education Statistics Agency, 2017 c), and the languages subject area contained combinations of foreign languages. The social studies subject area contained a range of seemingly diverse subjects: economics, politics, sociology and human geography. Lastly the historical and philosophical studies subject area contained history, philosophy, theology and archaeology. However to include combinations from within a single subject area would have required a manual review of degree titles and a subjective interpretation of what constituted a joint honours degree. For example, while it may have seemed appropriate to exclude 'Accounting and Finance', it might have been less clear as to whether 'Management and Marketing' should have been included as a joint honours degree.

An alternative method considered was to take the set of subjects studied as single honours and then define a joint honours degree as comprising a title that included two or three from this list. This would have avoided the difficulties encountered in deciding whether to include certain combinations from within a particular subject area. Using this methodology, 'Economics and Politics' would have been included, but 'Film and Media' would not. The challenge for this method lay in the quality of the data provided by the HESA DLHE survey. The textual degree title was not provided in a uniform or consistent format, for example the data included such degree titles as 'History + W Hist', 'Biol &

Spt Sci', 'Geog/Econ', and so this approach would have required a manual parse through the data to resolve these idiosyncrasies. Given the size of the dataset a manual intervention would probably have involved errors and was ruled out at this stage of the research.

In order to analyse the effect of completing a single honours degree compared with directly related joint honours degrees, in most of the analysis we removed 'single honours only' subjects, i.e. subjects were removed that did not feature in any of the joint honours degrees in the dataset, for example B5 Opthalmics and A4 Clinical Dentistry, see Table i. The rationale was that this study sought to establish whether there was an observable impact in studying two or three subjects as a joint honours degree that were also available to study as single honours, i.e. the impact was inherent in this mode of study, rather than in the actual subjects studied.

The following principal subjects have been removed from the analysis as they are not offered as part of a joint honours degree by any provider.

Table i Non-joint honours subjects

So that our study complemented the recent teaching quality assessment of UK universities under the Teaching Excellence Framework (TEF) (Higher Education Funding Council for England 2017) we used the same criteria for highly skilled employment or further study as defined by the Higher Education Funding Council for England (2015), namely that the definition of highly skilled employment was any occupation within categories 1-3 of the Standard Occupational Classification (Office for National Statistics 2010). All further study was also considered to be highly skilled and was therefore included wherever highly skilled graduate employability was referred to.

d. Results and Analysis

3d.1 Proportion of Students Completing Joint Honours in the UK

Table ii – Percentage of students completing single and joint honours degrees

Includes 'non-joint honours subjects' (see Table i)

Over the period 2011 – 2015 there has been a year-on-year decline in the proportion of students completing joint honours degrees, dropping roughly 0.5% points per year, equivalent to approximately 8700 students per year (Higher Education Statistics Agency 2017). The reasons for the decline possibly lie in the rise in tuition fees combined with the growing emphasis in the popular press (Tobin 2015) around the importance of highly skilled graduate employability. This has led to a growth in vocational subjects that guarantee the highest level of career success, such as teaching, medicine, engineering and dentistry, and which are not available as joint honours subjects.

Furthermore, according to HESA statistics (Higher Education Statistics Agency 2016), there has been a 24% rise in degrees in business studies during the period 2007-2014, and it is now the most popular subject in the country, with more than 78,000 first-year undergraduates. HESA data also suggests that science subjects, traditionally regarded as having higher employability rates, have increased enrolments at the expense of degrees in the humanities which are popular joint honours subjects. Science-related subjects had a 21% increase in student numbers between 2007 and 2014, while demand for philosophy and history degrees was flat.

3d.2 UK Highly Skilled Employment for all Degrees

Table iii - Percentage of graduates in highly skilled employment (TEF methodology)

Includes 'non-joint honours subjects' (see Table i)

This analysis of the DLHE dataset illustrated how highly skilled employment in the UK, when averaged over all degrees, has risen year-on-year for the past four years' worth of data. This accords with the recovery seen across the UK economy following the global financial crisis of 2007-2009, during which time highly skilled employment sank to its lowest level in a generation. Despite a year-on-year growth in student numbers and record levels of participation, there are high levels in highly skilled employment. When this is combined with the consistent wage advantage between graduates over school-leavers, then the value of a higher education at the national level appears to be robust. However at the level of the individual, these average national figures may hide substantial variation based on the subject(s) studied and/or the university from which the student graduated.

3d.3 Highly Skilled Employment by Honours Type

Table iv – Percentage of graduates in highly skilled roles by honours type

Excludes 'non-joint honours subjects' (see Table i)

As discussed in section 3c, the methodological approach taken was to exclude all subjects that were not also studied as joint honours subjects during the period of the 2011-2015 (the full list is in Table i). Secondly, the degrees identified as joint honours comprised those where the principal subjects came from different JACS subject areas. As noted, this algorithmic approach meant that in our study, joint honours degrees consisted of subjects from truly distinctive academic disciplines, bearing little resemblance in terms of their pedagogy and etymology, and therefore leading to diversity in the student experiences of teaching, learning and assessment styles.

We observed in Table iv, using these definitions, a consistently lower rate of highly skilled employment in joint honours graduates compared with single honours graduates. Year-on-year, despite a growth in highly skilled employment in both cohorts, the gap remained around 3% points when taken as a national average over the four years' of data in this study.

We may postulate that this gap stems from the challenges inherent in studying two or three diverse subjects including, but not exhaustively so, the organisational issues around timetabling, the communication problems between departments, the time management demands of competing assessment deadlines, and the general feeling of not belonging in either academic camp. The additional overhead in time and energy related to overcoming these obstacles may mean that joint honours students are less likely to engage with university enrichment activities (sporting, cultural, social) and the co/extra-curricular features of the degree that promote the acquisition of graduate attributes and lead to enhanced employability prospects. The published literature does not explore this hypothesis well, however scrutiny of the authors' own National Student Survey (NSS) open comments, together with other locally acquired survey information, provides anecdotal evidence that supports this assertion. Exploration of these ideas would usefully form the basis of future work.

3d.4 Highly Skilled Employment in Russell Group and non-Russell Group

Table v - Percentage of graduates in highly skilled roles by degree type and Russell Group membership

All years. Excludes 'non-joint honours subjects' (see Table i)

The Russell Group of universities (Russell Group 2016) comprises twenty four of the UK's most research active higher education institutions that generally feature near or at the top of most university league tables (The Complete University Guide 2017; The Guardian 2016; Times Higher

Education 2016). There are a number of top ranking universities that are not part of the Russell Group, e.g. St. Andrews, Loughborough, Lancaster, Bath, Surrey, Sussex (all members of the now defunct 1994 group), but nonetheless the Group represents a consistently high performing set taken over a range of metrics, and in particular in employability outcomes for its students. Unsurprisingly therefore our analysis of the highly skilled employment rates, averaged over all years, for both single and joint honours graduates of Russell Group universities exceeded the national average by a significant +9.04% points for single honours and +10.59% points for joint honours.

It was interesting to note that the gap between joint and single honours graduates was significantly smaller at -1.52% points than the national average (-3.07% points) when averaged over the Russell Group universities. In contrast, the gap was wider for the non-Russell Group universities, at -5.68% points. Analysis of the reasons for this are beyond the scope of this study but may usefully form a focus for further work; anecdotally, factors may include employers' high level of confidence in Russell Group graduates of any degree title, the self-confidence of the graduates themselves or the range and organisational management of joint honours degrees at these higher education institutions.

3d.5 Highly Skilled Employment in Post-1992 and Pre-1992 Universities

Table vi – Percentage of graduates in highly skilled roles by degree type and post-92 status

All years. Excludes 'non-joint honours subjects' (see Table i)

The post-1992 group of universities comprises any that were formed following the granting of university charters in 1992 to former polytechnics and colleges of higher education; most universities in the UK fall into the post-1992 category. The pre-1992 group comprises the Russell Group, plus around 35 other 'old' universities, including the now defunct 1994 group. Typically the post-1992 group have a higher diversity of students drawn from working-class homes and ethnic minorities

(Maddocks et al 2015). They are seen as '"business facing" higher education institutions producing graduates in vocational disciplines and (conducting) applied research' (Scott 2012). In our study, the post-1992 joint honours graduates did not fare well in terms of highly skilled employment six months after graduating; at 55.88%, this was 11.9% points lower than the national average for all joint honours graduates. Furthermore, this gap was wider than that for single honours graduates at post-1992 higher education institutions compared with the national average, which was 8.3% points lower. This suggested that graduates of joint honours degrees at post-1992 universities were disproportionately affected in terms of their highly skilled graduate employability. Again, a full reflection on the reasons for this lie beyond the scope of the present study, however the factors will possibly include employer attitudes towards the qualification and the graduates' own confidence in articulating the value of their degree. Furthermore, the post-1992 higher education institutions produce more entrepreneurs or free-lancers than pre-1992s (Taylor 2015) and this can potentially lead to a skewing of the DLHE data as often the graduate will not report that having their honours degree was a requirement of the job (Higher Education Statistics Agency 2015).

3d.6 Highly Skilled Employment in the Nations of the UK

Table vii - Percentage of graduates in highly skilled roles by degree type and UK nation

All years. Excludes 'non-joint honours subjects' (see Table i)

This analysis of highly skilled employment by nation within the UK (England, Wales, Scotland and Northern Ireland) highlighted substantial variation with joint honours graduates from Scottish universities having a +12.66% points advantage over joint honours graduates from Northern Ireland. In the Scottish university system it takes four years to complete an honours degree, rather than the three years found in the rest of the UK. Furthermore, in Scotland all students start out studying a broader base of subjects, specialising if they wish to in the later years of the degree. This

'normalises' the study of more than one subject and may therefore explain why graduates of Scottish joint honours degrees perform well in finding highly skilled jobs.

3d.7 Proportion of total students at each university completing joint honours degrees against percentage point difference between single honours and joint honours highly skilled graduate employability at that university.

Chart i – Proportion of total students completing joint honours programmes against percentage point difference between single honours and joint honours highly skilled proportion. Dot per higher education institution. Includes 'non-joint honours subjects' (see Table i)

Chart i examined the potential correlation between the percentage difference in highly skilled graduate employability between single and joint honours graduates at a particular higher education institution, and the proportion of joint honours students completing at that higher education institution. The purpose of this was to analyse whether graduates' employability outcomes worsened where joint honours degrees represented only a small part of the higher education institution's portfolio. Conversely we analysed where joint honours degrees were a larger part of the portfolio, perhaps 'normalising' this mode of study in the collective consciousness and activities of the staff and students. Chart i showed a significant, albeit weak, negative correlation – the lower the proportion of joint honours students completing at a university, the bigger the gap between their highly skilled employment and the single honours students completing at the same higher education institution.

3d.8 Proportion of total students at each university completing joint honours degrees against percentage point difference between single honours and joint honours highly skilled graduate employability completing at that university.

Chart ii - Proportion of total students completing joint honours programmes against percentage point difference between single honours and joint honours highly skilled proportion. Dot per higher education institution. Excludes 'non-joint honours subjects' (see Table i)

Chart ii repeated the analysis, but this time focussing only on subjects that were available as joint honours degrees. The correlation was slightly stronger and the significance was also slightly stronger. This analysis would suggest that there was some evidence for the hypothesis that joint honours graduates fared better where this mode of study was a more substantial part of their university's portfolio. University strategists and leaders may wish therefore to consider the potential risks to graduates' employability outcomes where the joint honours provision is a highly minority activity.

3d.9 Percentage of single honours graduates in highly skilled employment against percentage point difference between single honours and joint honours highly skilled proportion.

Chart iii - % of single honours graduates in highly skilled employment against percentage point difference between single honours and joint honours highly skilled proportion. Dot per higher education institution. Excludes 'non-joint honours subjects' (see Table i)

Chart iii was used to explore any link between universities that had better rates of highly skilled graduate employability in their single honours graduates and those higher education institutions also having a smaller gap between their single and joint honours graduates in highly skilled employment, i.e. did joint honours graduates track their single honours counterparts at that higher education institution in terms of improved or worsened employability? Chart iii showed that there was a non-significant very weak negative correlation, i.e. we did not find significant evidence that any relationship existed. This was despite finding in Table v and Table vi that joint honours graduates of

Russell Group or pre-1992 universities did fare better than non-Russell Group and post-1992, along with graduates of single honours degrees at these higher education institutions. However when analysed over all universities in the UK, there was no whole population relationship that could be significantly demonstrated.

3. Discussion

Based on the definition of the United Kingdom joint honours degree in this study, namely that a student studies two or three principal subjects from different JACS subject areas, we found that this mode of study had decreased by approximately 0.5% points year-on-year between 2011 and 2015. Furthermore we found an approximately consistent 3% point negative gap nationally in the highly skilled employment rates of joint compared with single honours graduates. This gap was at its lowest in the highly selective Russell Group universities (-1.52% points) and highest in post-1992, vocationally-oriented universities (-7.13% points) and in Northern Ireland universities (-12.45% points). Joint honours graduates of Scottish universities fared well, with a +3.09% point advantage over the national average for joint honours.

We found that universities that had a higher proportion of joint honours graduates generally had a lower employability gap between their joint and single honours graduates. We did not find any significant correlation between higher institutional levels of single honours employability and the gap between single and joint honours graduates.

These findings add significantly to the published research and data around joint honours students, which comprise around 10% of UK undergraduate graduates (UCAS 2016c), and at some universities the proportion is considerably higher (UCAS 2016a). Therefore although a minority activity, this is nonetheless a substantial number of graduates, approximately 50,000 a year (UCAS 2016c), and it is incumbent on university leaders to ensure their employment outcomes achieve parity with single honours graduates.

In seeking to interpret these findings we considered the potential dis-benefits of studying for a joint honours degree. Although superficially offering students more choice, often the study of a joint honours degree can mean that students have fewer modules or courses to choose from, as academics strive to ensure the study of the essential core of the subject by increasing the level of mandatory content. Alternatively because optional or elective units of study may clash with the secondary subject, there may be fewer options that are actually viable. Notwithstanding this, the ability to study two subjects, rather than the more usual one, to full honours degree depth, is a highly attractive option for some students in the UK who are not ready or willing to specialise.

The benefits rest around the intrinsic pleasure of learning across a broader curriculum, the intellectual satisfaction of flexing between differing academic sub-cultures, and the stimulation associated with a greater variety in learning, teaching and assessment styles. There are also enhanced opportunities for personal development associated with the demands placed on time-management, interpersonal skills, a diversity of friendship groups and the level of self-confidence required to thrive when traversing different academic disciplines.

The drawbacks are clearly centred on the frustration of these benefits into dis-benefits at universities where this mode of study is a minority activity; this may stem from poor support from academic and professional staff, inadequate organisation on the part of the university, or the failure of the student to react sufficiently positively to the demands of studying two subjects. Typically problems arise from timetable clashes and poor communication between the two subjects. There may also be a more existential challenge posed to the choice made by the student not to study single honours – somehow they are deemed to be not sufficiently serious to specialise and study the subject as single honours and so are less worthy of support and consideration. This can leave students feeling isolated and

lacking a sense of belonging, which can in turn damage their confidence and aspiration, and mean poor engagement with their learning and lower participation in enrichment activities.

A sense of belonging is crucial to student engagement and success (Thomas 2012) and more recently UK universities have been promoting the overall degree as the entity to which students relate, rather than individual modules or courses, and therefore placing the coherence and centrality of the entire degree at the heart of a good student experience (Briggs et al 2012). For single honours students this is relatively straightforward to achieve, since they have a 'home' within a single academic discipline. However joint honours students will have two 'homes' in different subject areas, and anecdotally the students can report feeling they do not belong or feel welcome in either subject area, leading them to feel marginalised and left out. The subsequent impact on the students' confidence and future career success may be an issue.

Joint honours students face organisational, academic and cultural challenges that require a positive, conscious and sustained effort to overcome, on both the part of the student and the higher education institution. It is certainly possible to manage these potential difficulties and achieve excellent degree and career outcomes but, in particular for graduates of the post-1992 universities, it appears that there is a negative relative impact on highly skilled employment. This impact is lessened if the university is Scottish (four year degrees with in-built breadth of study) or where the proportion completing joint honours degrees is relatively high.

Internationally, these findings might be replicated in countries having university systems similar to that found within the UK, but also where students are studying for a double major, in comparison with a single major. Since the double major mode of study is on the increase, the findings from the UK may also be of value in reflecting on the experience and outcomes of these students.

In conclusion, we set out to explore whether graduates with a joint honours degree were more or less likely to be in highly skilled employment, six months after graduation, compared with their single honours counterparts. In using a previously unpublished part of the DLHE dataset, the combinations of principal subjects studied, we were able to establish that there was an adverse effect. This adds a quantitative and reproducible finding to the literature around this topic, and does indicate a need for university leaders to focus on this mode of study and develop strategies for ensuring equity of employment outcomes.

4. Future Work

This study focussed on joint honours degrees in the UK where the two or three principal subjects fall into different JACS subject areas, i.e. the two or three subjects are necessarily diverse rather than academically cognate. Future work will consider the class of joint honours degrees where the principal subjects lie within the same JACS subject area, i.e. they may be closer academically, although still taught by different academic teams. This grouping will include, for example, pairs of foreign languages, some social sciences pairings such as politics and sociology, and pairings such as history and theology from the historical and philosophical subject area.

Further work will also include an analysis of the subjects studied and the relationship with highly skilled graduate employability, to identify whether certain subjects enhance employment irrespective of the characteristics of the higher education institution where they are studied.

By including other metrics and published data, along with the proposed further quantitative analysis of the DLHE data, we will seek to explore and explain some of the differences identified in this study. For example, by including the UK's National Student Survey (NSS) data around institutional student satisfaction, organisation and management, assessment and feedback, can we begin to better understand the factors and environment that influence highly skilled graduate employability?

Other quantitative metrics might include the characteristics of the students at particular higher education institutions in terms of gender, age, ethnicity, disability and social mobility. More qualitatively, does an institution's approach to the operational delivery of its joint honours degrees affect the graduates' employment outcomes, for example centralised versus devolved administrative and academic management.

This study has focussed on UK graduate outcomes, and future work will compare these findings with international outcomes, to analyse whether other university systems better serve the needs of students who are intent on studying a double major, or joint honours degree.

Ultimately, the over-arching goal of the research will be to provide higher education institutions with observations and recommendations that may assist them in providing double major or joint honours degrees that lead to excellent highly skilled graduate employability outcomes, and in closing the current gap between the single honours and joint honours graduates.

References

Blundell, R., Green, D., Wenchao, J. (2016). The Puzzle of Graduate Wages. *Institute for Fiscal Studies*. ISBN: 978-1-911102-16-8

Briggs, A.R.J., Clark, J. and Hall, I. (2012). Building bridges: understanding student transition to university. *Quality in Higher Education*. Vol. 18, Iss. 1, 2012

Corlett, A. (2016) Robot wars: automation and the labour market. Resolution Foundation. Available online at http://www.resolutionfoundation.org/publications/robot-wars-automation-and-the-labour-market/ (accessed on 26 March 2017).

Dale, S.B. and Krueger, A.B. (2014). Estimating the effects of college characteristics over the career using administrative earnings data. *Journal of human resources*. 49 (2): 323-58.

Destination of Leavers from Higher Education. (2015). Authors' proprietary dataset.

EUROSTAT. (2017) Employment rates of recent graduates. Available online at http://ec.europa.eu/eurostat/statistics-explained/index.php/Employment_rates_of_recent_graduates (accessed on 17 September 2017).

Green, F. and Henseke, G. (2016). Should governments of OECD countries worry about graduate over-education? *Oxford Review of Economic Policy*. Volume 32, Issue 4, Winter 2016

Elias, P. (1999). Moving on short report: graduate careers three years after graduation. Available online at https://www.hecsu.ac.uk/assets/assets/documents/MovingOnShortReport.pdf (accessed on 26 March 2017).

Higher Education Authority. (2017). Graduate Outcomes Survey. Available online at http://www.hea.ie/node/1589 (accessed on 26 March 2017).

Higher Education Funding Council for England. (2015). 2014-15 Funding and Monitoring Data overview. Available online at http://www.hefce.ac.uk/data/famd/latest/2014-15,overview/#section1 (accessed on 26 March 2017).

Higher Education Funding Council for England. (2017). Teaching Excellent Framework (TEF). Available online at http://www.hefce.ac.uk/lt/tef/ (accessed on 26 March 2017).

Higher Education Statistics Agency. (2017 a). Definitions: Destinations of Leavers (Longitudinal). Available online at https://www.hesa.ac.uk/support/definitions/longitudinal-destinations (accessed on 26 March 2017).

Higher Education Statistics Agency. (2017 b). JACS (the Joint Academic Coding System) is a way of classifying academic subjects and modules. Available online at https://www.hesa.ac.uk/support/documentation/jacs (accessed on 26 March 2017).

Higher Education Statistics Agency. (2017 c). JACS 3.0: Principal subject codes. Available online at https://www.hesa.ac.uk/support/documentation/jacs/jacs3-principal (accessed on 26 March 2017).

Higher Education Statistics Agency. (2015). Definitions: Destinations of Leavers. Available online at https://www.hesa.ac.uk/support/definitions/destinations (accessed on 26 March 2017).

Higher Education Statistics Agency. (2016). Graduate destinations. Available online at https://www.hesa.ac.uk/data-and-analysis/students/destinations (accessed on 26 March 2017).

Higher Education Statistics Agency. (2017). Higher education student enrolments and qualifications obtained at higher education providers in the United Kingdom 2015/16. Available online at https://www.hesa.ac.uk/news/12-01-2017/sfr242-student-enrolments-and-qualifications (accessed on 26 March 2017).

Holmes, C. and Mayhew, K. (2015). Over-qualification and skills mismatch in the graduate labour market. Available online at https://www.cipd.co.uk/knowledge/work/trends/graduate-labour-market-report (accessed on 26 March 2017).

Maddocks, S., Major, L.E. and Torgerson, C. (2015). Evaluating Access. The Sutton Trust. Edition 9: December 2015. Available online at http://www.suttontrust.com/wp-content/uploads/2015/12/Evaluating-Access_December-2015.pdf (accessed on 27 March 2017).

Marginson, S. (2016a). The worldwide trend to high participation higher education: dynamics of social stratification in inclusive systems. *Journal of Higher Education*. Volume 72, Issue 4, pp 413-434.

Marginson, S. (2016b). High participation systems of higher education. *Journal of Higher Education*. Volume 87, 2016 – Issue 2.

Minocha, S., Hristov, D. and Reynolds, M. (2017), From graduate employability to employment: policy and practice in UK higher education. International Journal of Training and Development, 21: 235–248. doi:10.1111/ijtd.12105

NCES. (2017). Employment rates of college graduates. Available online at https://nces.ed.gov/fastfacts/display.asp?id=561 (accessed on 17 September 2017).

OECD. (2017). Employment by education level. Available online at https://data.oecd.org/emp/employment-by-education-level.htm#indicator-chart (accessed on 17 September 2017).

Office for National Statistics. (2010). Standard Occupational Classification. Available online at http://www.neighbourhood.statistics.gov.uk/HTMLDocs/dev3/ONS_SOC_hierarchy_view.html (accessed on 26 March 2017).

Paton, G. (2014). Universities to offer US-style 'major and minor' degrees. Available online at http://www.telegraph.co.uk/education/universityeducation/10865699/Universities-to-offer-US-style-major-and-minor-degrees.html (accessed on 26 March 2017).

Pettinger, T. (2011). Number of Students at University in the UK. Economics Help. Available online at http://www.economicshelp.org/blog/3190/education/number-of-students-at-university-in-uk/ (accessed on 26 March 2017).

Prospects Net. (2017). Graduate Destinations in the last ten years (Winter 2006/07). Available online at http://ww2.prospects.ac.uk/cms/ShowPage/Home_page/Main_Menu___News_and_information/Graduate_Market_Trends_2006/Graduate_destinations_in_the_last_ten_years__Winter_06_07_/p!ecdFepe#118670 (accessed on 26 March 2017).

Russell Group. (2016). Profile. Available online at http://russellgroup.ac.uk/media/5420/profile-of-the-russell-group-june-2016.pdf (accessed on 26 March 2017).

Scott, P. (2012). It's 20 years since polytechnics became universities and there's no going back. Available online at https://www.theguardian.com/education/2012/sep/03/polytechnics-became-universities-1992-differentiation (accessed on 26 March 2017).

Taylor, H. (2015). Who is the world's biggest employer? World Economic Forum. Available online at https://www.weforum.org/agenda/2015/06/worlds-10-biggest-employers/ (accessed on 26 March 2017).

Taylor, M. (2015). The rise and rise of the graduate entrepreneur. Available online at https://www.policybee.co.uk/blog/11117/graduate-entrepreneur (accessed on 26 March 2017).

The Complete University Guide. (2017). University League Tables 2017. Available online at https://www.thecompleteuniversityguide.co.uk/league-tables/rankings (accessed on 26 March 2017).

The Guardian. (2016). University league tables 2017. Available online at https://www.theguardian.com/education/ng-interactive/2016/may/23/university-league-tables-2017 (accessed on 26 March 2017).

Thomas, L. (2012). Building student engagement and belonging in Higher Education at a time of change. Available online at https://www.heacademy.ac.uk/system/files/what_works_final_report_0.pdf (accessed on 26 March 2017).

Times Higher Education. (2016). Best universities in the UK 2017. Available online at https://www.timeshighereducation.com/student/best-universities/best-universities-uk (accessed on 26 March 2017).

Tobin, L. (2015). Love or money? High tuition fees lead students to vocational degrees. Available online at https://www.theguardian.com/education/2015/aug/04/love-money-tuition-fees-student-vocational-degrees-jobs-university-business (accessed on 26 March 2017).

UCAS. (2016a). Applicants and acceptances for universities and colleges – 2016. Provider by subject group. Available online at https://www.ucas.com/corporate/data-and-analysis/ucas-undergraduate-releases/ucas-undergraduate-end-cycle-data-resources/applicants-and-acceptances-universities-and-colleges-%E2%80%94-2016 (accessed on 21 December 2017)

UCAS. (2016b). Applicants and Acceptances by Groups of Students. Available online at https://www.ucas.com/corporate/data-and-analysis/ucas-undergraduate-releases/ucas-undergraduate-end-cycle-data-resources/applicants-and-acceptances-groups-applicants-2016 (accessed 26 March 2017).

UCAS. (2016c). Applications and acceptances for types of higher education course – 2016. Available online at https://www.ucas.com/corporate/data-and-analysis/ucas-undergraduate-releases/ucas-undergraduate-end-cycle-data-resources/applications-and-acceptances-types-higher-education-course-2016 (accessed 26 March 2017).

UK Data Service. (2017). Resolution Foundation analysis of Labour Force Survey. Available online at https://discover.ukdataservice.ac.uk/series/?sn=2000026 (accessed 26 March 2017).

Universities UK. (2016). Higher Education in Numbers. Available online at http://www.universitiesuk.ac.uk/facts-and-stats/Pages/higher-education-data.aspx (accessed 26 March 2017).

University of Derby internal survey

Walker, I. and Zhu, Y. (2011). Differences by degree: evidence of the net financial rates of return to undergraduate study for England and Wales. *Economics of education review*. 30 (6): 1177-86.

Webber, D.A. (2014). The lifetime earnings premia of different majors: correcting for selection based on cognitive, noncognitive, and unobserved factors. *Labour economics*. 28: 14-23.

Table i Non-joint honours subjects

JACS Code	Principal Subject
A1	Pre-clinical Medicine
A2	Pre-clinical Dentistry
A9	Others in Medicine and Dentistry
B5	Ophthalmics
G02	Broadly based programmes in computer science (2011/12 only)

D1	Pre-clinical Veterinary Medicine
D2	Clinical Veterinary Medicine & Dentistry
D9	Others in Vet Sci, Ag & related subjects
H9	Others in Engineering
I5	Health Informatics
J1	Minerals Technology
K0	Architecture, Build & Plan: any area
K9	Others in Architecture, Build & Plan
W0	Creative Arts & Design: any area
A3	Clinical Medicine
A4	Clinical dentistry

Table ii – Percentage of students completing single and joint honours degrees

DLHE year	Single honours	Joint honours
2011/12	89.24%	10.76%
2012/13	89.61%	10.39%
2013/14	90.22%	9.78%
2014/15	90.71%	9.29%
All years	89.95%	10.05%

Table iii - Percentage of graduates in highly skilled employment (TEF methodology)

DLHE year	% graduates
2011/12	65.24%

2012/13	67.01%
2013/14	69.16%
2014/15	72.08%
All years	68.39%

Table iv – Percentage of graduates in highly skilled roles by honours type

DLHE year	Single honours	Joint Honours
2011/12	64.30%	60.98%
2012/13	66.00%	63.60%
2013/14	68.29%	65.82%
2014/15	71.31%	67.78%
All years	67.51%	64.44%

Table v - Percentage of graduates in highly skilled roles by degree type and Russell Group membership

Russell group?	Single honours	Joint Honours
Member	76.55%	75.03%
Non-member	64.84%	59.16%

Table vi – Percentage of graduates in highly skilled roles by degree type and post-92 status

Post-92?	Single honours	Joint Honours
Post-92	63.01%	55.88%

Non-Post 92	73.01%	70.57%

Table vii - Percentage of graduates in highly skilled roles by degree type and UK nation

Post-92?	Single honours	Joint Honours
England	67.28%	64.86%
Northern Ireland	67.33%	54.87%
Scotland	71.94%	67.53%
Wales	64.98%	57.50%

Chart i – Proportion of total students completing joint honours programmes against percentage point difference between single honours and joint honours highly skilled proportion. Dot per higher education institution. Includes 'non-joint honours subjects' (see Table i)

Statistical output from Chart i

Correlations

	Difference	Proportion

Difference	Pearson Correlation	1	-.236**
	Sig. (2-tailed)		.008
	N	126	126
Proportion	Pearson Correlation	-.236**	1
	Sig. (2-tailed)	.008	
	N	126	126

**. Correlation is significant at the 0.01 level (2-tailed).

Statistical output from Chart ii

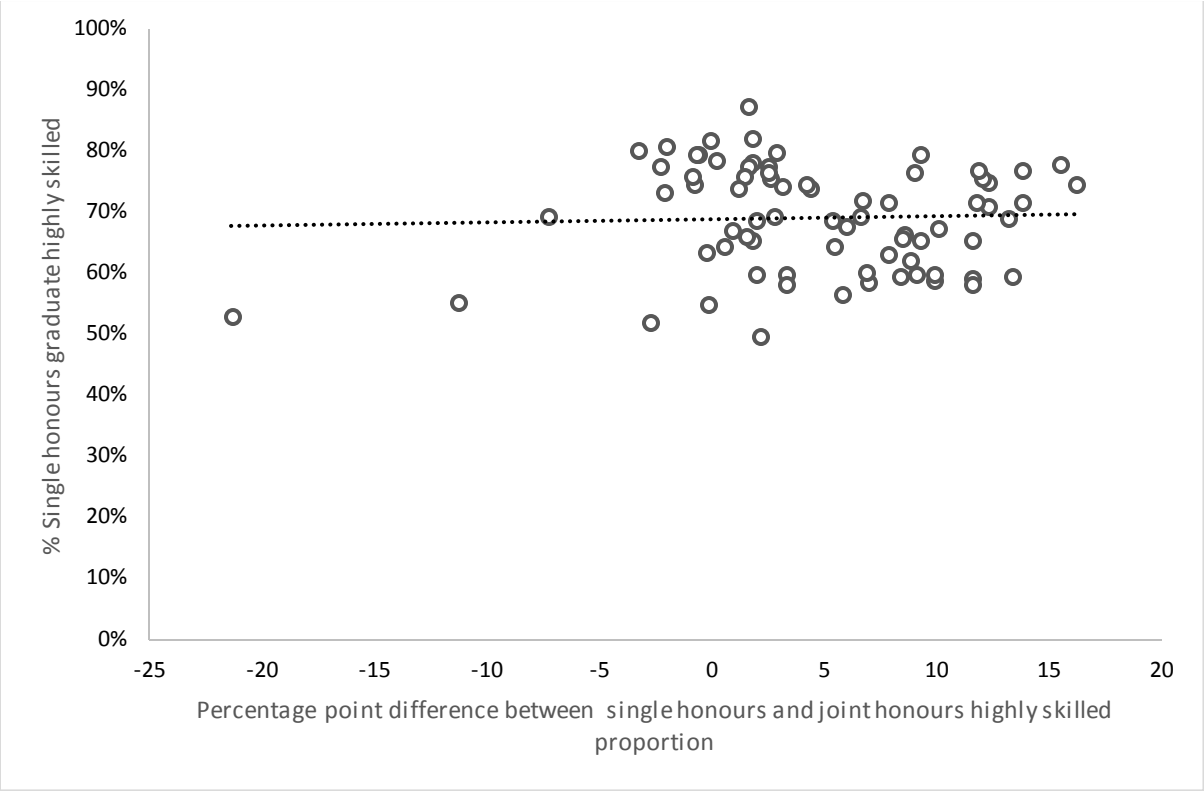
Correlations

		Difference	Proportion
Difference	Pearson Correlation	1	-.247**
	Sig. (2-tailed)		.005

	N	126	126
Proportion	Pearson Correlation	-.247**	1
	Sig. (2-tailed)	.005	
	N	126	126

**. Correlation is significant at the 0.01 level (2-tailed).

Chart ii - Proportion of total students completing joint honours programmes against percentage point difference between single honours and joint honours highly skilled proportion. Dot per higher education institution. Excludes 'non-joint honours subjects' (see Table i)



Statistical output from Chart iii

Correlations

		Single	Difference
Single	Pearson Correlation	1	-.113
	Sig. (2-tailed)		.208
	N	126	126

Difference	Pearson Correlation	-.113	1
	Sig. (2-tailed)	.208	
	N	126	126

Chart iii - % of single honours graduates in highly skilled employment against percentage point difference between single honours and joint honours highly skilled proportion. Dot per higher education institution. Excludes 'non-joint honours subjects' (see Table i)